is a highly corrosive acid that is frequently formed on the surface of the process wafer.

005 Figure 1 shows a typical process chamber configuration used in STI etching. The typical process chamber, for example, includes several different etching chambers, 10, 12, 14, and 16, in addition to a wafer orientation chamber 18, a cool down chamber 24 and loadlock chambers 20 and 22. The robotic arm transfer mechanism is centrally located at 26. In a typical process in STI etching, as explained, several different etching steps with different etching chemistries may be involved thus having the process wafer transferred by robotic arm 26 between multiple etching chambers, for example 10, 12, 14, and 16. Following etching, the process wafer may be transferred by robotic arm 26 to cool down chamber 24 to cool the process wafer prior to transfer to a loadlock chamber, for example, 20 or 22 where the chamber is pressurized to atmospheric pressure for unloading.

006 During this process, corrosive acids, such as HBr may condense onto the process wafer surface which also contains for example, loose particles from the etching process. Further, during the pressurization process the particles may become dislodged and adhere to the chamber walls and robotic arm thereby causing corrosive damage to the chamber and robotic arm as well as to the process wafer. As a result, over time, the loadlock chambers accumulate residual corrosive particles which can cause damage to process wafers as they are moved through the loadlock chamber thereby necessitating frequent equipment shutdown for cleaning. Another shortcoming of the prior art procedure and apparatus for STI etching may be potential adverse health consequences to equipment operators from an undesired buildup of such contamination.

007 There is therefore a need in the semiconductor processing art to develop apparatus and methods whereby the level of acid (e.g., HBr) contaminated particles on process wafers and STI etching apparatus in an STI etching procedure is reduced thereby minimizing damage to both process wafers and STI etching

apparatus as well as reducing the potential effect of adverse health consequences.

008 It is therefore an object of the invention to provide a method and apparatus whereby the level of acid (e.g., HBr) contaminated particles is reduced in an STI etching process while overcoming other shortcomings and deficiencies in the prior art.

SUMMARY OF THE INVENTION

009 To achieve the foregoing and other objects, and in accordance with the purposes of the present invention, as embodied and broadly described herein, the present invention provides a method and apparatus for reducing acidic contamination on a process wafer following a plasma etching process.

0010 In a first embodiment of the present invention, a method is provided for reducing acidic contamination on a process wafer following a plasma etching process including providing an ambient controlled heating chamber for accepting transfer of a